

# Photointerrupters(Reflective)

KODENSHI

## DG - 105

The DG – 105 carrying a unique hysteresis transistor (BAMBIT) developed by KODENSHI CORP. facilitates digital output by means of two leads. This digital photointerrupter, because of its ultra – compact size, requires little space.

### FEATURES

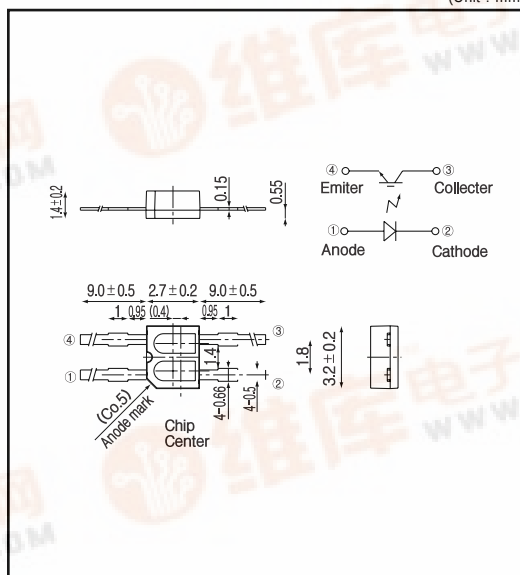
- DIGITAL OUTPUT : directly connect to a microcomputer digital port.
- HYSTERESIS : stable against chattering of the object
- HIGH – SPEED RESPONSE : faster than phototransistor type
- Setting easy

### APPLICATIONS

- Detection of paper or marks
- Detection of high – speed object
- Detection of bar codes

### DIMENSIONS

(Unit : mm)



### MAXIMUM RATINGS

(Ta = 25 °C)

| Item              | Symbol            | Rating            | Unit        |
|-------------------|-------------------|-------------------|-------------|
| Input             | Power dissipation | P <sub>D</sub>    | 75 mW       |
|                   | Forward current   | I <sub>F</sub>    | 50 mA       |
|                   | Reverse voltage   | V <sub>R</sub>    | 5 V         |
| Output            | Collector current | I <sub>C</sub>    | 0.5 mA      |
|                   | C - E voltage     | V <sub>CEO</sub>  | 10 V        |
|                   | E - C voltage     | V <sub>ECO</sub>  | 0.3 V       |
| Operating temp.*1 |                   | T <sub>opr.</sub> | - 25 ~ + 85 |
| Soldering temp.*2 |                   | T <sub>sol.</sub> | 260         |

\*1.No icebound or dew

\*2.For MAX.5seconds at the position of 1mm from the package

### ELECTRO-OPTICAL CHARACTERISTICS

(Ta = 25 °C)

| Item         | Symbol                        | Conditions                          | Min.                                                                 | Typ. | Max. | Unit. |
|--------------|-------------------------------|-------------------------------------|----------------------------------------------------------------------|------|------|-------|
| Input        | Forward voltage               | V <sub>F</sub>                      | I <sub>F</sub> = 10mA                                                |      | 1.3  | V     |
|              | Reverse current               | I <sub>R</sub>                      | V <sub>R</sub> = 5V                                                  |      | 10   | μA    |
|              | Peak wavelength               | λ <sub>p</sub>                      | I <sub>F</sub> = 20mA                                                | 940  |      | nm    |
| Input        | Operating supply voltage rang | V <sub>CC</sub>                     |                                                                      | 2.0  | 5.0  | V     |
|              | Low level output voltage      | V <sub>OL</sub>                     | V <sub>CC</sub> = 5V, I <sub>F</sub> = 0mA, R <sub>E</sub> = 100k Ω  | 0.5  | 0.7  | V     |
|              | High level output voltage     | V <sub>OH</sub>                     | V <sub>CC</sub> = 5V, I <sub>F</sub> = 20mA, R <sub>E</sub> = 100k Ω | 4.5  | 4.7  | V     |
|              | Peak wavelength               | λ <sub>p</sub>                      |                                                                      | 880  |      | nm    |
|              | Threshold input current*4     | I <sub>FHL</sub>                    | V <sub>CC</sub> = 5V, R <sub>E</sub> = 100k Ω                        | 2.0  | 7.2  | mA    |
| Transmission | Hysteresis*5                  | I <sub>FHL</sub> /I <sub>FHLH</sub> |                                                                      | 0.85 |      | -     |
|              | L → H propagation time        | t <sub>PLH</sub>                    | V <sub>CC</sub> = 5V, I <sub>F</sub> = 20mA, R <sub>E</sub> = 100k Ω | 15   |      | μsec. |
|              | H → L propagation time        | t <sub>PHL</sub>                    |                                                                      | 40   |      | μsec. |
|              | Rise time                     | t <sub>r</sub>                      |                                                                      | 4.5  |      | μsec. |
|              | Fall time                     | t <sub>f</sub>                      |                                                                      | 25   |      | μsec. |

\*3. I<sub>F</sub> represents forward current when output changes from low to high.

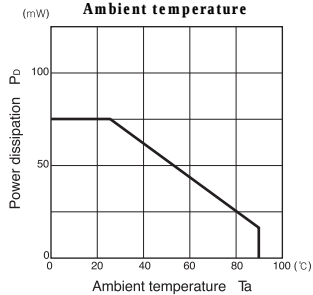
\*4. I<sub>FHL</sub> represents forward current when output changes from high to low.



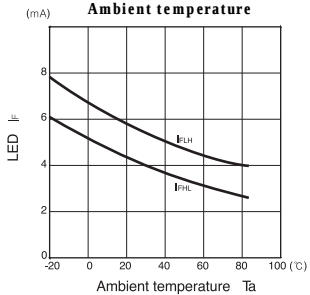
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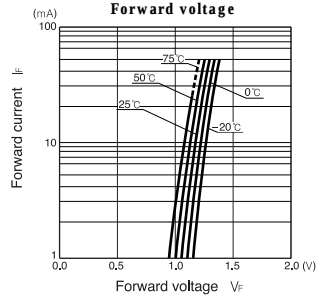
**Power dissipation Vs.  
Ambient temperature**



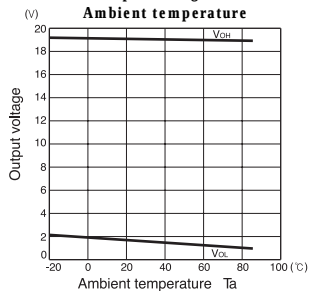
**Threshold input current Vs.  
Ambient temperature**



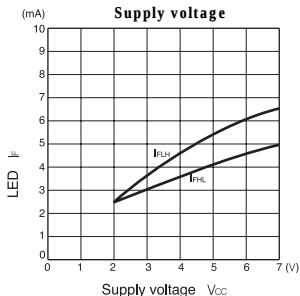
**Forward current Vs.  
Forward voltage**



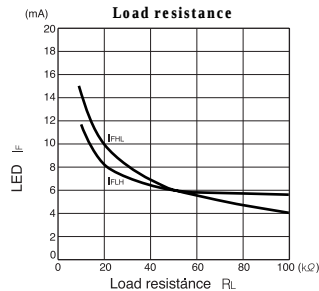
**Output voltage Vs.  
Ambient temperature**



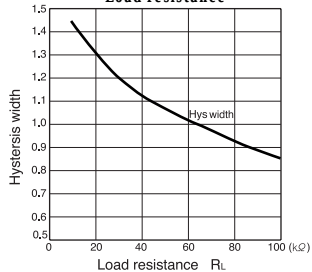
**LED Vs.  
Supply voltage**



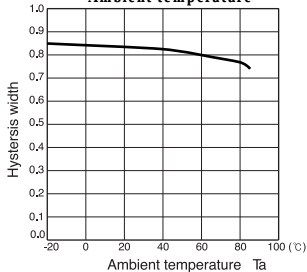
**LED Vs.  
Load resistance**



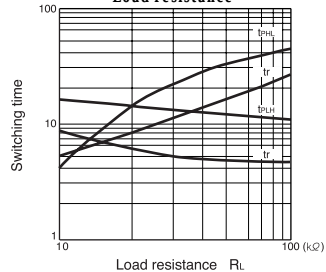
**Hysteresis width Vs.  
Load resistance**



**Hysteresis width Vs.  
Ambient temperature**



**Switching time Vs.  
Load resistance**



**Output voltage Vs.  
Distance**

